REMARKS

This paper is responsive to the Office Action dated Jun 10, 2009 wherein claims 1 - 7, and 9 - 22 were rejected. In view of the following remarks, Applicant requests further examination and reconsideration of the present patent application.

Amendments to specification

The applicant respectfully brings to the attention of the Examiner that paragraph [0041] and [0042] have been rewritten to better explain the embodiments as shown in Fig.6 and Fig. 7. No new subject matter has been added in rewriting these paragraphs.

35 USC 112

Applicant respectfully traverses the rejection of claims 1 - 7, and 9 – 22 under 35 USC §112 first paragraph, as failing to comply with the written description requirement.

1. The Examiner contends that - The Original disclosure fails to teach to teach the reformer in fluid isolation with respect to the combustor. The Applicant respectfully disagrees.

Fig. 6 of the present application is reproduced herewith.

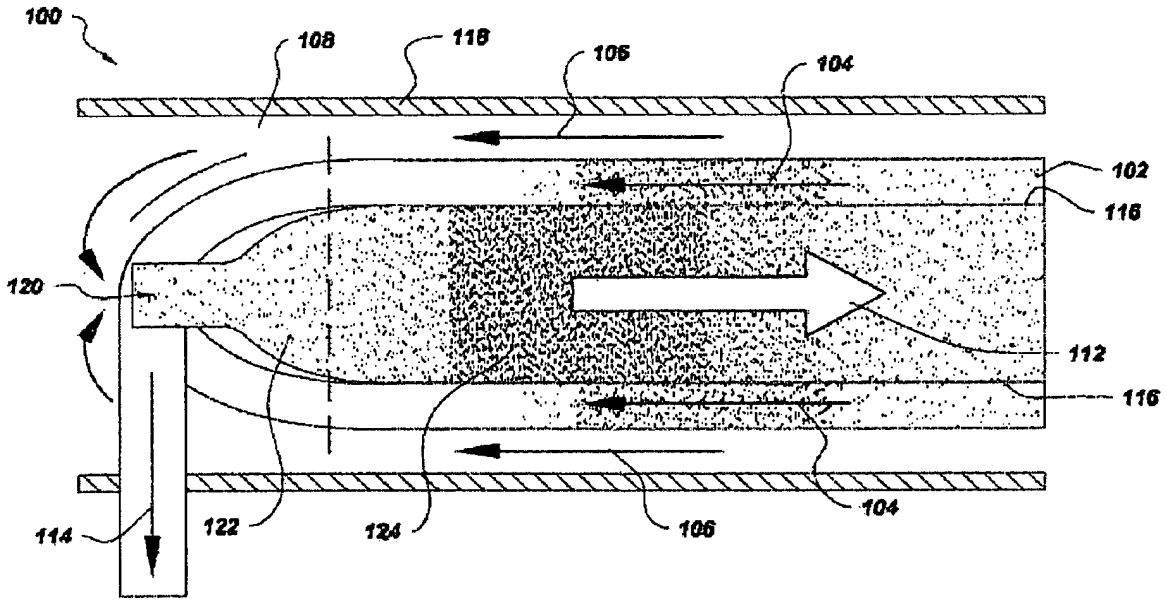

Fig. 6 is described in paragraph 41 of the present application, which recites inter alia,

> The reforming process takes place in a tube 102, which tube is in intimate contact with the combustor 110, wherein the reformer 102 and the combustor 110 are concentric. The compressed air flows through the annular space 108 in the pressure shell as indicated by the airflow 106. The air enters the combustor 110 through the entry port 120. The fuel, such as hydrogen, natural gas or an off gas is also sent to the combustor 110 at the same location (not shown) ..... The combustion zone 124 primarily generates the heat of the combustion that is dissipated radially and axially through the surface 116, which surface is in contact with the reformer 102 the liner of the combustor gets cooled thereby enhancing the life of the combustor. The combustor and the reformer are in fluid isolation and thermally connected for efficient heat transfer ..... In the process of heat transfer from the combustor 110 to the reformer 102, the liner of the combustor gets cooled thereby enhancing the life of the combustor. A mixture of reforming fuel and steam circulates in the annular space in the reforming tube 102 as indicated by the mixture flow path 104. The reformate, which typically comprises CO_2, CO, H_2, water and unburned fuel exits the reformer 102 through an opening 114.

Thus, description clearly brings out the construction details of the coupled reformer-combustor 100. In addition to description of heat transfer from the combustion chamber to the reformer, it also clearly describes the direction and path of flow of gases in the region. As discussed the reforming takes place in the reforming tube 102 and it exits the system at opening 114. Thus there is no flow happening across the wall of the combustor and reformer and the combustor and reformer are fluidically isolated.

This fact is also clearly brought out in Fig. 7, reproduced herewith.

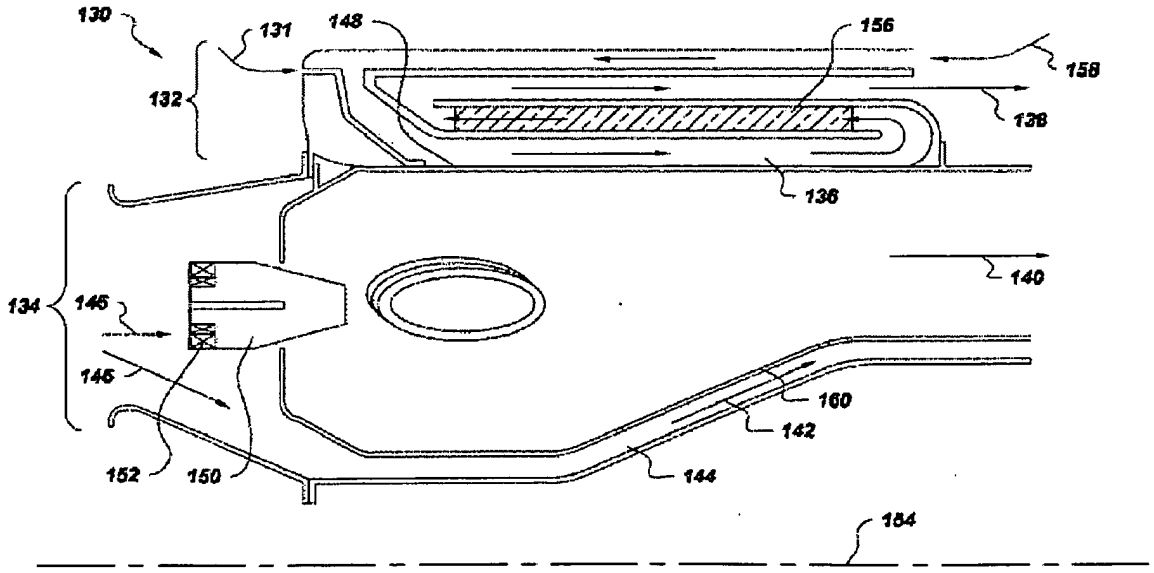

Fig. 7

Fig. 7 is described in paragraph 42 of the present application, which recites inter alia,

> The combustor is an annular structure in the shape as illustrated in Fig. 7 when rotated 360 Degree along the centerline 154. The reformer 132 is another annular structure rotated 360 Degree along the same centerline 154. The combustor 134 comprises an upper liner 148 in intimate contact with the reformer 132 and a bottom liner 160. The upper liner 148 keeps the combustor 132 and reformer 132 in fluid isolation and intimate thermal contact with each other ..... The reformer 132 comprises a path 131 for introducing steam and a path 158 for introducing a reforming fuel. The mixture of the reforming fuel and steam flows through the path 136 wherein the endothermic reaction (1) absorbs the heat transferred from the combustor 134 into the reformer 132. The heat energy is transferred from the combustor 134 to the reformer 132 through radial and axial heat dissipation through conduction and convection thereby cooling the outer liner 148 of the combustor 134. The reformer 132 further comprises a catalyst bed 156, which catalyst bed 156 contains a reforming catalyst, such as nickel. The reformate flows out of the reformer 132 through a flow path 138. The inner liner 160 of the combustor 134 is cooled using a portion of the compressed air 146, wherein the air 142 is circulated though an annular space 144 between the inner liner 160 and the bottom shell 162 of the combustor.

Thus, the combustor and the reformer are separated by liner 148. The path of the effluent stream from the combustor (shown as stream 140) and effluent from reformer (shown as stream reformer (138)) are quite different as is evident in Fig. 7. As clearly mentioned in the text above and shown in Fig. 7, the reforming fuel is introduced from path 158. Thus there is only thermal communication between the combustor and the reformer as discussed in above paragraph. The Fig. and the description clearly show that there is no transfer of any material across the wall between the combustor and the reformer.

Thus, Fig. 6, Fig. 7 and associated description clearly brings out that the reformer is in fluid isolation with respect to the combustor. Applicant respectfully requests that the Examiner withdraw the rejection under 35 USC 112.

2. The Examiner further mentioned in the office action that "Applicant fails to disclose where the hydrogen (line 16 in Fig. 1) goes after it is separated. Applicant furthermore suggests that a portion of hydrogen stream 16 is used as a fuel for the combustion process in the combustor 6 (para 36)."

The Applicant would like to refer to same paragraph 36. It describes Fig. 2. As shown in Fig. 2, the reformate stream 44 is sent to a heat exchanger, Shift reactor 56 where carbon monoxide and water react to produce CO2 and more hydrogen. The exit stream from shift reactor 56 is sent to a separation device 62 that separates hydrogen 16 from the stream leaving CO2 rich stream 14. Thus, stream 16, which is a substantially pure hydrogen stream as

mentioned in paragraph 16 is then sent out for various uses. It is not an endeavor of the present application to list all the possible uses of hydrogen. As discussed in paragraph 1, - present invention relates to energy generation systems and more particularly to co-production of hydrogen and electrical energy. Paragraph 3 further recites - Hydrogen, one of the most extensively used fuels, that is produced in such a co-production plant can be used in several ways including electricity generation. One such use is mentioned in paragraph 36 – which is a portion of the hydrogen stream 16 is used as a fuel for the combustion process in the combustor 6. The present application does not recite or even hint of using hydrogen from reformer directly into the combustion chamber. The reformate stream is sent through the various stages mentioned above, generating a substantially pure hydrogen stream 16, one of the uses of which is used in the combustion chamber.

As discussed previously, paragraph 42 and Fig. 7 clearly show a separate fuel entry path for combustor and reformer and there is no stream moving from the reformer to the combustor. The only coupling between the two is the heat exchange from the combustor to the reformer.

3. The examiner further mentions in the office action that fluid isolation was not specifically disclosed. The Applicant respectfully disagrees.

As discussed in MPEP 2163.06, "Information contained in any one of the specification, claims or drawings of the application as filed may be added to any other part of the application without introducing new matter." The Applicant illustrates herewith that all the claim amendments have adequate support in the specification and drawings.

As is clearly described, Fig. 6 and 7 clearly show fluid isolation between the reformer and the combustor.

The Examiner mentions on Page 2 of the Office Action that claims 1 – 7 and 9-22 may contain allowable subject matter if the 112 rejections above are overcome. Applicant believes that the above discussion clearly overcomes the rejection and hence requests the allowance of claims 1-7 and 9 – 22.

Summary

For the reasons set out above, Applicant respectfully submits that the application is in condition for allowance. Favorable reconsideration and allowance of the application are, therefore, respectfully requested.

If the Examiner believes that anything further is necessary to place the application in better condition for allowance, the Examiner is kindly asked to contact Applicant's undersigned representative at the telephone number below.

Respectfully submitted,

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